NOTES.

The *Endurance*, with Sir Ernest Shackleton and the Imperial Trans-Antarctic Expedition on board, left London on Saturday last. The vessel will leave Plymouth for the Antarctic on Saturday next with a crew of seventeen, and six or eight members of the Weddell Sea-shore party. The remaining members of this party will sail in the middle of September by mail steamer for Buenos Aires.

We learn from the *Times* that the Scottish Spitsbergen Expedition, under the leadership of Dr. W. S. Bruce, director of the Scottish Oceanographical Laboratory (referred to on p. 512 of Nature, July 16), left Tromsö on the morning of July 24. Dr. Bruce has chartered the sailing ship *Pelikane*, and is proceeding to Wybe Jansz Water, where he will land a party under the direction of Mr. R. M. Craig on the east coast of the mainland. From there he will go with the ship to Green Harbour, Ebeltoft Harbour, and Prince Charles Foreland. Dr. Bruce will return with the *Pelikane* to Wybe Jansz Water to continue the hydrographic survey of the loch, while Mr. Craig, it is hoped, will be able to carry on the geological researches, which he will have begun during Dr. Bruce's absence in the west.

An expedition under the leadership of Miss M. A. Czaplicka, who holds a travelling fellowship of Somerville College, Oxford, is being sent out by the Universities of Oxford and Moscow, for the purpose of studying the tribes of the Yenesei region. The other members are Mr. H. A. Hull, of Philadelphia University, in charge of physical anthropological work; Miss Haviland, zoologist and ornithologist; Miss Curtis, photographer. The tribes which will be investigated are the Tungus and Ostiak of the Yenesei, both with Mongoloid affinities, though physically distinct. The question of group marriage, peculiarities of the tribal wizard, and their religion are included in the scope of the inquiry. The expedition will be absent for about a year, and is supplied with carefully selected equipment and provisions.

It is stated in *Science* that Mr. C. Boden Kloss and Mr. H. C. Robinson, director of museums, Federated Malay States, are engaged in an expedition to Mount Indrapura or Korinchi in Central Sumatra —a volcano 12,700 ft. high, and the highest summit in the island. The objects of the expedition are zoological and botanical, but it is hoped to ascend to the summit of the mountain and make observations of the crater and the present activity of the volcano.

We learn that the committee of the Capt. Scott Memorial Fund has accepted the offer of the Admiralty of a site at Greenwich Hospital for the erection of the memorial to the explorers who lost their lives in the Antarctic region. It has been stipulated by the Admiralty that the memorial shall harmonise with the architecture of neighbouring buildings.

The death is announced, at the age of sixty-seven, of M. Paul Reclus, who was largely instrumental in making general the use of cocaine as an anæsthetic in surgery. He was elected a member of the Paris Academy of Medicine in 1895.

Mr. John Hood, whose recent death, at an advanced age, is announced from Dundee, was well known to many zoologists and microscopists as a collector of the more minute forms of fresh-water life and especially of the Rotifera. The study of these attractive little animals was the hobby of his life, and though he published little under his own name, he gave very important assistance to many other workers. It is only necessary to turn the pages of Hudson and Gosse's great Monograph to see how largely they were indebted to him for the material on which they worked, and his name is quoted on almost every other page as authority for some statement regarding the bionomics or occurrence of a species. He was especially successful in obtaining new and curious forms of the sessile Rotifers forming the group Rhizota, which in recent years have been somewhat neglected in favour of the more easily collected free-swimming species. Mr. Hood was a mechanic by trade, and in his later years, when laid aside from work, he was in straitened circumstances, and sometimes perilously near actual privation. Only a year ago, a small pension from the Murdoch Trust, obtained at the instance of some of his scientific friends, brought ease of mind and some comfort to his last days. Probably very few of his numerous correspondents knew him personally, but those who did know that he represented a particularly fine type of the "working-man naturalist," a type which is, perhaps, commoner in the north country than in the south, and which was more characteristic of the nineteenth century than it promises to be of the twentieth.

As already announced (see Nature, December 18, 1913), an International Congress of Meteorology is to be held in Venice in September next. From a circular just received, we learn that the Congress will take place on September 17, 18, and 19, and will be divided into three sections, dealing respectively with climatology and agrarian meteorology; aerology; general and maritime meteorology. The communications and discussions are to be in English, French, German, or Italian, and those intending to take part must send their applications and subscriptions to the secretary of the executive committee (Osservatorio Patriarcale della Salute, Venice) before August 31. The subscription will be 10 lire (8*s*.).

The fourteenth French Congress of Medicine is to be held at Brussels on September 30, October 1, 2, and 3. The president will be Prof. Henrijean, of Liége, and the general secretary Prof. R. Verhvogen, 22 rue Joseph II., Brussels. Among the subjects to be discussed are cardio-vascular syphilis; vaccinotherapy in general, and in particular vaccinotherapy of cancer and typhoid fever; the therapeutic value of artificial pneumothorax; lipoids in pathology.

An illustrated lecture on the modification of response in plants under the action of drugs is to be delivered on October 30 before the Royal Society of Medicine by Prof. J. C. Bose, of Calcutta.

The thirteenth competition for the Riberi prize, the value of which is 800*l*., is now open. It is to be awarded for scientific researches in medical science, and is given under the auspices of the Royal Academy of Medicine of Turin. Names of competitors will be received until December 31, 1916. Entry forms may be obtained from Dr. V. Oliva, secretary of the Royal Academy of Medicine, 18 Via Po, Turin.

LORD SALVESEN, the president of the Scottish Zoological Society, has intimated his willingness to bear the cost (estimated at about 1000*l.*) of the erection of a house in the Zoological Park for the accommodation of the smaller and more delicate mammals.

A CITY GUILD has been established at Coventry having as its object the preservation of historic buildings and places of natural beauty. It will work upon the same lines as the society as Stratford-on-Avon which, though only two years old, has already done good work.

WE have received from the British Association Committee for Radiotelegraphic Investigation copies of the programme of observations to be made during the total solar eclipse of August 21 next, and of the three forms, A, B, and C, which have been issued by the committee for use during the eclipse. Form A is for records of the measurement of signal strength; form B gives instructions and explanatory remarks concerning graphic records; and form C is for observations on strays. It should be mentioned that on the occasion of the eclipse, five high-power wireless telegraph stations in Europe will each make a series of special emissions to provide facilities for the observation of strays, and for the measurement of the strength of signals—hence the issue of the above-named documents. It is requested that experimenters in wireless telegraphy possessing such apparatus of precision as will enable them to make accurate measurements will communicate with Mr. W. Duddell, 56, Victoria Street, S.W. Prospective observers, willing to make aural estimates of signal strength, or to make observations on strays (either by the graphic record method, or by the method of registering the number heard during every thirty seconds), should intimate their willingness and state which portion of the observations they can undertake, to the honorary secretary, British Association Radiotelegraphic Committee, 88, Gower Street, W.C. They should also state the number and the names of the five sending stations with which it would be most convenient for them to work.

THE report of the Astronomer-Royal to the Board of Visitors has been issued as a White Paper. In it it is stated that the old time ball at the Royal Observatory, Greenwich, is to be replaced by a new aluminium ball. The time ball was first erected in 1833. An electric current from the clock was first used to drop it at 1 o'clock in 1852. In 1855 the ball was blown down into the courtyard. Some repairs were made in 1895, when the chain broke during winding, and again, in August, 1913, some temporary repairs were made to the ball.

THE President of the Local Government Board has authorised the following researches to be paid for out of the annual grant voted by Parliament in aid of scientific investigations concerning the causes and processes of disease. These are in addition to the investigations already announced:— (1) an investigation of the details of the technique in carrying out Wassermann's reaction for the diagnosis of syphilis. Major Harrison, acting in collaboration with a sub-committee of the Pathological Section of the Royal Society of Medicine, will carry out this investigation. (2) An investigation by Mr. H. J. Gauvain, in collaboration with the Board's pathological staff, into the cutaneous tuberculin reactions of cases of tuberculosis of bones and joints of bovine and human sources. (3) A continuance of the investigation of Drs. Twort and Mellanby on infantile diarrhœa, with special reference to the conditions governing the absorption of toxic substances from the alimentary canal. (4) A further investigation into the causes of still-births by Drs. C. J. Lewis and Dale.

AN extremely interesting presidential address on "The Service of Medicine to Civilisation" was delivered by Prof. Victor Vaughan before the American Medical Association in June (see *Science,* July 3, 1914). One statement of importance is made, viz., that infectious disease picks out the fit rather than the unfit, and therefore does not benefit the race by the elimination of the unfit. Prof. Vaughan claims increased state-aid for scientific investigation, and says that he has no sympathy with the idea that medical research should be largely relegated to special non-teaching institutions, for the man who is devoid of the spirit of scientific investigation should have no place in medicine as student, practitioner, or teacher!

WE have received No. 4 of the *Indian Journal of Medical Research,* which completes the first volume of this important publication. It contains a number of papers on tropical research, and is well produced and illustrated.

Two circulars which we have received serve as an illustration of what can be done, and is being done, in the study of nature in and around London. One is from Prof. Flinders Petrie, president of the Hampstead Scientific Society, pointing out the danger of extermination of the majority of the animals and plants in the parts of North London which are now being rapidly built over, and appealing for assistance from residents in and visitors to the district in the attempt of the Hampstead Scientific Society to compile a complete record of the natural species still to be found within three miles of the flagstaff on the summit of Hampstead Heath, communications to be made with the secretaries of the society at 32 Willoughby Road, Hampstead. The second circular is from the curator of the Whitechapel Museum, 77 High Street, E., and consists in a description of the arrangements made for visits of school classes to this museum and to the Nature-Study Museum, both being controlled by the borough of Stepney. Nearly two thousand school classes have visited the museums mentioned during the last four years, while both are available for school visits, the Nature-Study Museum confines itself mainly to the display of living plants and animals, the grounds containing many fine trees and also a wild flower garden with a large collection of growing British plants labelled by their common names, and in addition to an observation beehive, a large vivarium with reptiles and batrachians, and a collection of the score or so of wild birds which visit or nest in the grounds, there are about seventy freshwater and marine aquaria, containing a fine series of aquatic plants and insects, mollusca, anemones, and fishes.

MR. W. W. SMITH has contributed to the Records of the Botanical Survey of India (vol. iv., No. 7) an interesting account of the alpine and subalpine vegetation of south-east Sikkim, more especially that of the ridges lying between the two passes, Cho-La and Tanka-La. The list of the 925 species of flowering plants and ferns collected is preceded by an exceedingly interesting general description of the flora of this high region, with reference to the climatic and other conditions of the area, one of the wettest in the Himalayas.

WE are glad to learn that the marine biological investigations at the Cape of Good Hope, which were suspended, in part at any rate, for some years, have again been resumed under the direction of Dr. J. D. F. Gilchrist. The Marine Biological Report, No. 1, has now been issued, and contains two papers of considerable economic interest. The first of these is on the Cape crawfish and the crawfish industry. The somewhat changeable history of the industry is recorded, and the prospects of future development discussed. The main part of the paper is, however, devoted to a study of the natural history of the species, which leads up to a consideration of the possible ways in which the industry may be preserved. The second paper contains an account of the various species of the herring and allied families, which live in Cape waters. The number of these is considerable, but it does not seem probable that many of them offer a prospect of a successful fishery.

To the July number of the *American Naturalist* (vol. xlviii., p. 385) Dr. Glover M. Allen contributes the first part of a remarkably interesting and original article on the development of colour-pattern in mammals and birds, dealing in this instance almost exclusively with the development of semi-albinism in domesticated mammals. In the opinion of the author, mammals and birds have five paired centres of maximum development, and a single azygous frontal centre. Where these areas come into contact with one another, that is to say, on their peripheries, the intensity of the pigmentation is, of necessity, much less than at the centres. A consequence of this is the tendency to the development of non-pigmented areas at the lines of junction, such light tracts being denominated "primary breaks." One of such unpigmented areas occurs on the middle line of the lower surface of the body; there is another between the ear-patches, and a third on the side of the neck. In piebald horses and cattle an unpigmented tract is very generally situated in the neighbourhood of the shoulder, and another in the lumbar region, one or both of which may embrace the associated limb. How very closely the colour-pattern of horses agrees in this respect with that of cattle is made apparent by the figures with which the article is illustrated, and it will not fail to be noticed that the two main light tracts approximately follow the lines of the limb-girdles, as was pointed out years ago by a writer to whom the author appears to make no reference. "Dappling" in horses, which has been regarded as an archaic feature, is considered by Dr. Allen to be more probably a secondary development.

DR. ROLF WITTING continues to carry out most valuable hydrographical work in the Gulf of Finland, and in *Finlandändische Hydrographisch-Biologische Untersuchungen*, No. 12, the observations for the year 1912 are published. As in former years, salinity and temperature observations have been made on special cruises, as well as more continuous series of observations on lightships. The ice conditions are also fully recorded. Finland is to be congratulated upon having carried out its hydrographical work for a number of years in a thorough and systematic way, being in many respects considerably ahead of some of the larger countries that took up this work in 1903, in connection with the International Fishery investigations.

To the April issue of the Proceedings of the Philadelphia Academy Dr. N. E. McIndoo contributes a long article on the olfactory sense in Hymenoptera, as exemplified by ants and hornets. The special object of the experiments on which the article is based was to establish, in the first place, the relative sensibility of these insects to various odours; secondly, to ascertain the situation of the olfactory organs; and, thirdly, to determine how other Hymenoptera compare with ants and hornets in the perception of scents. Various opinions have been held with regard to the seat of smell in insects, but the general view at the present day is that this is situated in the antennæ, although it has been pointed out that since these appendages are coated with hard membrane, they are ill-fitted to receive and assimilate olfactory stimuli. Dr. McIndoo finds that the so-called olfactory pores of the legs and wings are the true smelling organs, and that the antennæ take no part in the olfactory function.

PUBLICATION No. 192 of the Carnegie Institution includes (p. 263) a contribution by Dr. Ch. Schuchert on the "Climates of geologic time," in which much attention is paid to the occurrence of glacial epochs from the "proterozoic" periods to recent times. The author regards crustal deformations, which may possibly be rhythmic, as the most potent cause of climatic change. Dr. Schuchert, in association with Prof. Barrell, has just issued another paper of wide import, "A revised geologic time-table for North America" (*Am. Journ. Sci.*, vol. xxxviii., 1914, p. 1), which also emphasises the conception of rhythmic movements of the surface. These produce marked changes in the fauna, especially on land. The table summarising our knowledge of pre-Cambrian history will be useful to many teachers.

PROF. W. H. HOBBS has published, through the Macmillan Company of New York (price 1*s*.), a pamphlet on "Simple Directions for the Determination of the Common Minerals and Rocks," with an appendix on geological maps and models; the use of wooden blocks, the inclination of which can be varied, to represent the outcrop of strata is distinctly suggestive. A student of geology should know much more about the foundations of mineralogy than is here given; but these pages were originally drawn up as a supplement to the author's physiographic work on "Earth Features and their Meaning."

MR. H. DEWEY'S well-illustrated account of the geology of North Cornwall, in the Proceedings of the Geologists' Association, vol. xxv. (1914), part iii., will aid many visitors to the county. The conspicuous plain that cuts across the structure of the country at 300 to 400 ft. above the sea is regarded as due to marine denudation occurring in Pliocene times. A steep bluff represents the coast-line limiting this plain. Mr. T. C. F. Hall adds a petrological study of the St. Austell granite, in which the important problem of kaolinisation is discussed.

GEOLOGISTS may note in *Fortschritte der Mineralogie,* for 1914, an elaborate review, by M. Stark, with a bibliography of 534 entries, on the question of petrographic provinces. From the work of Judd in 1876, who is quoted in the bibliography as "W. Iudd," we are brought through a large number of regions where relationships have been claimed for igneous rocks of diverse characters. As a result of this survey, two main groups, already unfortunately named by Becke Atlantic and Pacific, are held to be well established, and we are led to understand that an original magma combining these materials no longer exists as an important feature of the crust. The author concludes that the Pacific type dominated in early geological ages, while the Atlantic type has been brought almost to an equality with the Pacific since Eocene times, and will ultimately prevail completely over it.

THE Geological Survey of New Jersey, under the care of Dr. H. B. Kümmel, has issued a "Geologic Map" of the State on the scale of 1 : 250,000. The general strike of the beds, whether Palæozoic or Mesozoic, is north-east and south-west, and influences one great feature of the country, the course of the Delaware River, which forms the frontier for fifty miles along the foot of Cretaceous escarpments. The Hudson on the east similarly works down along the strike under the famous Triassic dolerite "palisades." The choice of colours gives a highly artistic character to the map.

IT is frequently observed that in certain conditions of the atmosphere unusual visibility of distant objects exists. In *Symons's Meteorological Magazine* for December last, Mr. S. Miller referred to the phenomenon and asked what are the physical conditions that produce it, and whether it is admitted to be a prognostic of rain. An interesting discussion followed, in which several well-known men of science have taken part. Opinions as to the prognostic are about equally divided. Mr. W. H. Dines (Mag. for June) thinks visibility is more prevalent in rainy weather, but after, just as much as before, rain. Also, that haziness is dependent on the character of the district from which the air comes; smoke from the London or Clyde districts can be traced for a hundred miles. Dr. John Aitken (Mag. for July) concludes, from a large number of observations at Falkirk (Stirling), that transparency is adversely affected (1) by humidity, and (2) by the density of the population in the direction from which the wind blows. There is, however, no doubt as to the general popularity of the rain prognostic; a former careful observer (Rev. G. T. Ryves), referring to the well-known rhymes sometimes ascribed to Dr. Jenner, and including the line: "The distant hills are looking nigh," remarks that visibility is "one of the most generally accepted signs of rain."

SINCE their systematic classification by Luke Howard in 1803 and the modifications introduced by international agreement in recent years, the observation of the forms and motions of clouds has become one of the most important aids to successful weather study, and Prof. W. Davis remarks in his excellent "Elementary Meteorology" that "if the observer wishes to learn something of atmospheric processes for himself, he should give at least as much time to cloud observations as to all other records put together." We therefore welcome an interesting address to the Occidental College on the clouds of California by Dr. F. A. Carpenter, local forecaster of the U.S. Weather Bureau. Although occupying only eighteen pages it contains much useful information on the composition and formation of clouds. To the usual nomenclature he adds a local form: *el velo,* sometimes known as "high fog," which occurs morning and evening between May and September along a large part of the coast. Storm clouds are most frequent over the northern portion of the State, where cloudless days average less than 100 in a year; in the southern part, *e.g.*, at San Diego, there are nearly 300 cloudless days. Notwithstanding the proverbial sunny skies of California, the author states that most of the known varieties of cloud can be observed there.

THE current *Bulletin* of the Imperial Institute (vol. xii., No. 2) contains among the reports of recent investigations by the scientific and technical staff the results of the examination of soils from Nyasaland, of penguin guano from the Falkland Isles, and of flax from the East Africa Protectorate, where there is every prospect of the cultivation of this fibre becoming established in Nyanza Province. Other reports relate to cocoa from Nigeria, copals from British West Africa, and cohune nuts from British Honduras. Coffee cultivation in Uganda is dealt with by Mr. W. Small, botanist of the Department of Agriculture in this colony. Coffee is now the staple crop of European planters in Uganda. The area is being extended, and large increases in the exports of coffee may be shortly looked for. An article on the utilisation of fish and marine animals as sources of oil and manure discusses the composition and uses of fish oils, their sources and preparation, and describes the present position of the whaling industry. Fur farming in Canada and the tin resources of Malaya and India are dealt with in separate articles. Considerably more than half of the world's supply of tin is now produced within the British

Empire; the output in 1911, the latest year for which final figures are obtainable, was: British Empire 60,497 tons, foreign countries 54,051 tons.

No. 3 of vol. viii. of the *Biochemical Journal* contains two papers, emanating from the Lister Institute, of great general interest. The first, by Mr. Evelyn Ashley Cooper, deals with the curative action of autolysed yeast on avian polyneuritis; the solution obtained retains its curative power for at least eight weeks, and is apparently quite non-toxic. The autolysis of brewers' yeast should therefore afford a simple, inexpensive method of preparing a solution suitable for the oral treatment of human beri-beri. The second paper deals with the bases of gas-works tar, which are believed to be the predisposing cause of pitch-cancer, with special reference to their action on lymphocytes, and a method for their inactivation. The bases which are capable of exciting cell-division are found to occur in the anthracene fraction of the tar, and two bases of this kind have been isolated in the form of picrates, but have not yet been identified satisfactorily. A simple method of rendering these bases inactive consists in heating the tar to a temperature of about 160°, and blowing ordinary or ozonised air through it; in this way the auxetics are rendered harmless by oxidation.

For many years considerable inconvenience has been experienced in the sheet-metal trade in consequence of misunderstanding as to the recognised gauge for iron and steel sheets and hoops. A series of sizes known as the "B.G." gauge, or Birmingham gauge, was adopted by the South Staffordshire Ironmasters' Association in 1884, and were very generally accepted in the trade concerned; but many buyers have persisted in ordering sizes belonging to other systems, such as the "B.W.G.," or Birmingham wire gauge, which has no legal status, and is often confused with the imperial standard wire gauge legalised in 1883. Neither of these gauges is, however, recognised in the iron trade for sheets and hoops, and, in consequence, mistakes have often been made, leading in some cases to litigation. At the instance of the metal trades section of the London Chamber of Commerce, the Board of Trade was approached in 1912 with a view to the legalisation of the "B.G." gauge, and, after consideration, they decided in August last to prepare the necessary order in council. This order in council has now been issued, and comes into operation on November 1 next, on which date all the "B.G." sizes from 15/0 B.G., or 1 in., to 52 B.G., or 0·00095 in. will become legal denominations of imperial measure, and will accordingly be admissible for verification and stamping by inspectors of weights and measures. In the interest of the metal trade generally, it is to be hoped that the illegal and arbitrary "B.W.G." will then cease to be specified by purchasers.

An admirable "Report on Radiation and the Quantum Theory," by Mr. J. H. Jeans, has been published by the Physical Society of London. It contains an introductory portion showing in simple language the need for a quantum theory, followed by a general discussion of the radiation problem on the lines of the classical mechanics, an account of the development of the quantum theory, and special chapters on line spectra, photo-electric effects, and specific heat. The need for some theory not based upon Newtonian mechanics is shown by the fact that in all known media there is a tendency for the energy of any systems moving in the medium to be transferred to the medium, and ultimately to be found in the shortest vibrations of which the medium is capable. Thus, a system of corks connected by springs, and floating in a tank of water, will transfer any vibrational energy they have to water-waves, and ultimately to molecular heat. This tendency, which results from Newtonian mechanics, is not observed in the phenomena of radiation. Otherwise a hot body in a perfectly reflecting enclosure would transfer all its heat to the æther within the enclosure. Max Planck got over this difficulty by supposing that radiant energy is not emitted until it has reached a certain minimum quantity or "quantum." However difficult it may be to imagine such a process, Mr. Jeans agrees with the late Henri Poincaré that some such discontinuity in the structure of energy is imperatively required by experimental evidence.

The June issue of the Memoirs of the Manchester Literary and Philosophical Society contains seven memoirs, and extends to 140 pages. The whole of the memoirs have been issued separately by the society during April and May at intervals subsequent to their reception which vary from one to four months, the average being about two and a half months. This average does not differ much from that which obtains in the Royal Society of London and other societies. The various memoirs cover a wide range of subjects. One by Mr. R. F. Gwyther introduces a new specification of stress from which a great simplification of treatment results. Another by Mr. W. Cramp describes measurements of the flow of air through pipes, but ignores the work published by the National Physical Laboratory on the subject during the last four years. Mr. A. D. Hall, in a third memoir, shows how the old view that the plant derives nutrition direct from fertilisers in the soil represents the facts better than the newer one of Messrs. Whitney and Cameron, according to which all soils give a soil solution of the same composition from which the plant derives its nutrition and into which it excretes substances toxic to its kind. Two memoirs by Messrs. T. A. Coward and W. M. Tattersall are devoted to a valuable survey of the fauna of Rostherne Mere, a secluded fresh-water lake in the north of Cheshire. These remarks suffice to show that the society maintains a high standard in its memoirs.

In a paper read before the Tokyo Physico-Mathematical Society in April, which appears in the June number of the Science Reports of the Tohoku University, Prof. K. Honda puts forward a new theory of magnetism which appears to follow the experimental facts more closely than any previous theory. It is based on the following assumptions. The molecules, or in a solid, the molecular groups, which are in thermal agitation, have magnetic moments which are functions of the temperature. Their action on each other is due partly to actual impacts, partly to the magnetic field each sets up in its neighbourhood. In general the second effect is small compared with the first. When an external field is applied, both the impacts and the molecular fields tend to oppose the rotation of the magnetic axes of the molecules or molecular groups into line with the field. If the molecules or groups are elongated in shape the impacts almost entirely prevent rotation and the substance is paramagnetic. If the molecules or groups are spherical the impacts have only a small effect, rotation is resisted mainly by the mutual magnetic actions and the substance is ferromagnetic. Diamagnetism he considers to be atomic in nature and only another aspect of the Zeeman effect.

OUR ASTRONOMICAL COLUMN.

COMET 1913*f* (DELAVAN).—The following is the ephemeris for Delavan's comet (1913*f*) for the current week (*Astronomische Nachrichten*, No. 4739):—

	R.A. (true)			Dec. (true)			Mag.
	h.	m.	s.	°	′	″	
Aug. 6 ...	6	21	19·9	... +40	40	17·9	
7 ...		24	46·8	... 41	0	47·7	... 6·1
8 ...		28	18·3	... 41	21	20·0	
9 ...		31	54·4	... 41	41	53·7	
10 ...		35	35·7	... 42	2	28·0	
11 ...		39	21·8	... 42	23	1·9	... 5·9
12 ...		43	13·2	... 42	43	34·5	
13 ...	6	47	10·0	... +43	4	4·6	

The current number of the *Observatory* (August) states that this comet was detected by Mr. W. H. Steavenson on July 4 at an altitude of 1°. It was of about the 6th magnitude, had a nucleus of magnitude 7·5, and a head of five minutes in diameter; daylight prevented the tail from being observed. It is expected that the object will be visible to the naked eye in September and October, but no more confident prediction than this can now be made.

NEBULAR ROTATION.—In this column on June 4 (vol. xciii., p. 361) reference was made to an announcement by Prof. Lowell of the discovery, by spectroscopic means, of the rotation of the Virgo Nebula. Dr. V. M. Slipher now publishes (Lowell Observatory Bulletin, No. 62) a brief communication describing in more detail the discovery in question. It seems that about a year ago a spectrogram of the Virgo Nebula N.G.C. 4594 showed the nebula lines to be inclined. A second plate verified the above, but was not considered sufficiently satisfactory to warrant a public announcement of the discovery. A recent photograph confirms the previous deduction, and it is stated that the inclination of the lines, which is analogous to that produced by the diurnal rotation of a planet, "is unmistakable, and leads one directly to the conclusion that the nebula is rotating about an axis." This nebula has a radial velocity of fully a thousand kilometres a second. The nebula is of a "spindle" type, and the slit of the spectroscope was placed over the long axis: these nebulæ are thus spirals seen edgewise, as previous observations of their form have led one to believe. The fact is now proved. Dr. Slipher promises the details of the observations in a general discussion of the spectrographic observations of nebulæ made since 1912. Some of the numerous spectrograms of nebulæ taken at Flagstaff have shown indications of inclined lines, among them being the great nebula in Andromeda, and he hopes to give a definite answer to the important question of the rotation of this the greatest of spiral nebulæ.

SOLAR PHYSICS OBSERVATORY, CAMBRIDGE.—The first annual report of the director of the Solar Physics Observatory, Cambridge, to the Solar Physics Committee covers the year commencing April 1, 1913. The introductory remarks contain a statement indicating the circumstances in which the observatory is now administered, and deplore the loss of three members of the committee, namely, Sir George Darwin, Sir Robert Ball, and Sir David Gill, since the appointment of the committee in June, 1912. After a reference to the purchase of additional land extending down to the Madingley Road and to the selection of instruments to be used, the new buildings are next described. These include an extensive and complete laboratory building forming an extension at the west end of the astrophysical building, a spectroheliograph house, a dome 27 ft. in diameter for the 3-ft. reflector, etc. The energies of the staff are stated to have been chiefly confined to getting the observatory into working order, and for this reason systematic work not involving fresh observations was undertaken, and night work put somewhat in abeyance. Under the heading "Stellar Work," the photographic and visual observations made with the Newall telescope are recorded. These consist of spectrograms of variable stars and visual observations of the spectra of fine novæ. A discussion of spectrograms of Nova Persei No. 2 has been completed, and an atlas of typical stellar spectra with assigned chemical origins of the lines is in course of preparation. Under the heading, "Solar Work," that with the spectroheliograph and the McClean solar instruments is dealt with, while in meteorological physics a brief account is given of the investigations in atmospheric electricity and experimental work on ionising radiations. Preparations were made for the observations of the coming eclipse of the sun, the director and two members of the staff planning to take up their station near Feodosia in the Crimea.

ANNALS OF THE ROYAL BELGIUM OBSERVATORY.—The second part of vol. xiii. of the Annals of the Royal Observatory of Belgium contains three separate memoirs. The first is confined to the details of observations of variable stars made at that observatory during the period 1907 to 1912 by Messrs. G. van Biesbroeck and L. Casteels. Forty-six stars are here studied and the total number of observations published is 3225. Chief attention has been paid to new variables which have not been well studied. In many cases their identity was so ambiguous that the authors have studied the stars themselves, and for the sake of future observers have published charts of the regions where those stars were not included in the Bonner *Durchmusterung*. In many cases light curves accompany the text. The second portion of the volume brings together the observations made with the 38 cm. aperture equatorial by Dr. G. van Biesbroeck during the period 1907 to 1912; these comprise the observations of double stars, comets, minor planets, and phenomena. The third and last portion, by M. L. Casteels, summarises the physical observations of comets made by him in the years 1910 and 1911. Both the second and third portions are accompanied by numerous illustrations of the details observed in comets' heads.